

### Valves for Agricultural Irrigation

- PGA 1", 1 1/2", and 2" Plastic Electric Valves 24VAC
- PESB 1", 1 1/2", and 2" Plastic Electric Valves 24VAC
- BPES 3" Hybrid Brass and Plastic Electric Valves 24VAC

Rugged, reliable, versatile. Rain Bird valves are engineered to perform under demanding conditions in agricultural irrigation systems. Got dirty water? Just use the PESB or BPES Series valves with the patented self-cleaning scrubber feature, which keeps grit and contaminants from building up and clogging internal ports. Need pressure regulation? Add the new optional PRS-D dial pressure regulating module for smooth, accurate downstream pressure control.

All valves feature the internal bleed solenoid for manual operation, even with pressure regulation. And all of this performance is available at an affordable price. Rain Bird valves, performance and value.

#### Applications

- Zone control for sprinkler and micro irrigation systems
- System headworks control
- Master valve pressure regulation
- Filter control
- Specialty Rain Gun systems - wastewater, dust control of coal piles and feedlots, pastures, arenas, and logyards

#### Common Features

- Flow control handle to adjust flows as needed
- Turn of solenoid handle permits manual operation with internal bleed. Allows pressure regulation without electrical operation. (BPES model - turn the adapter 1/4 turn counterclockwise)
- Electrical
  - Power: 24 VAC 50/60 cycle solenoid
  - Inrush current: 0.41 A (9.9 VA)
  - Holding current: 0.28 A (6.7 VA)
  - BPES: Model A solenoid with adapter
- One-piece solenoid design with captured plunger and spring for easy servicing



*PESB Series 1 1/2"*



*BPES Series 3"*

- Accept optional field installed PRS-D pressure regulating module with adjusting dial. Control pressure from 15 to 100 psi (1,0 to 6,9 Bars). Simple adjustment with no external tubing. (See section on PRS-Dial)



*PGA Series 1 1/2"*

## PESB and BPES Series Valves

Built-in rugged performance for the toughest field conditions

The heavy duty PESB and BPES valves are designed to handle dirty water and pressure surges often found in agricultural irrigation systems. Both



feature the patented nylon scrubber device, which scrapes a stainless steel screen every time the valve opens and closes. This prevents debris build-up and clogging, with no external piloting. The PESB 1", 1 1/2", and 2" series globe valves are constructed of industrial-strength glass-filled nylon with stainless steel studs for long term service and easy maintenance.

The BPES 3" series globe / angle valves feature brass body and glass-filled nylon bonnet construction. Both are built to withstand 200 psi (13,8 bars) operating pressure. An external bleed manual operation is standard for evacuating debris without passing through the solenoid ports. And their low flow operating capabilities ensure reliable operation for both sprinkler and micro irrigation systems.

### PESB and BPES Features

- Durable glass-filled nylon construction (BPES has heavy duty brass body) rated to 200 psi (13,8 bars)
- Patented scrubber mechanism to resist clogging of internal ports
- Manual internal and external bleed Pressure regulation operation without electrical signal using internal bleed (BPES model - turn adapter)

- Globe configuration (**BPES only:** Globe and angle configuration)



- Convert to pressure regulating operation by adding PRS-D module (Shown with BPES)

### Operating Range

- Pressure: 20 to 200 psi (1,38 to 13,8 Bars)
- Flow: 0.25 to 300 gpm (0,06 to 45,40 m<sup>3</sup>/h; 0,02 to 12,60 l/s)

### Models

- 100PESB 1" NPT (25mm)
- 150PESB 1 1/2" NPT (40mm)
- 200PESB 2" NPT (50mm)
- 300BPES 3" NPT (75mm)

Notes:

1. Valve and PRS-D module must be ordered separately
2. BSP models available, please specify when ordering



PESB 1 1/2" with PRS module

### Performance Data - PESB

#### Pressure Loss (psi)

gpm	100-1"	150-1 1/2"	200-2"
0.25	0.8	0.06	0.02
0.5	1.0	-	-
1	1.3	-	-
5	1.7	-	-
10	1.8	-	-
20	2.9	4.0	-
30	5.6	3.6	-
40	10.0	2.7	-
50	15.6	2.4	3.1
75	-	4.2	2.9
100	-	8.5	3.9
125	-	14.6	6.8
150	-	21.2	10.0
175	-	-	13.6
200	-	-	17.5

#### Pressure Loss (bars)

m <sup>3</sup> /h	l/s	100-1"	150-1 1/2"	200-2"
0.06	0,2	0,05	-	-
1	0,28	0,11	-	-
2	0,56	0,12	-	-
3	0,83	0,15	-	-
4	1,11	0,18	-	-
5	1,39	0,24	0,27	-
6	1,67	0,32	0,26	-
7	1,94	0,41	0,24	-
8	2,22	0,54	0,21	-
9	2,50	0,68	0,19	-
10	2,78	0,84	0,18	-
12	3,33	-	0,18	0,21
14	3,89	-	0,22	0,21
16	4,44	-	0,26	0,20
22	6,11	-	0,55	0,26
28	7,78	-	0,98	0,46
34	9,45	-	1,46	0,69
40	11,11	-	-	0,95
45	12,50	-	-	1,18

### Performance Data - BPES 3"

#### Pressure Loss (psi)

gpm	Globe	Angle
60	7.5	6.8
80	7.4	7.1
100	7.3	6.8
120	5.8	5.2
160	1.8	1.8
200	2.2	1.9
250	3.3	2.6
300	4.9	3.5

#### Pressure Loss (bars)

m <sup>3</sup> /h	l/s	Globe	Angle
14	3,89	0,52	0,47
20	5,56	0,51	0,48
30	8,33	0,32	0,29
40	11,11	0,14	0,13
50	13,89	0,18	0,15
60	16,67	0,26	0,20
68	18,89	0,34	0,24

Notes:

1. Loss values are with flow control fully open.
2. PRS-D module recommended for use below bold line.

# PGA Series Valves

Globe / angle valves at an affordable price

The PGA series valves are high performance, versatile, and economical. These globe and angle configuration valves allow installation either inline or on risers feeding individual zones.



And the PVC construction is designed to handle 150 psi operating pressures. Like the PESB and BPES series valves, the PGA valves have a flow control and internal bleed solenoid for manual internal bleed operation. They can also be easily converted to pressure regulating operation by adding the PRS-D. Available in sizes from 1", 1 1/2", and 2".

## PGA Features

- Globe / angle PVC construction rated to 150 psi (10,35 bars)
- Manual internal bleed. Pressure regulation operation without electrical control signal
- Convert to pressure regulating operation by adding PRS-D module

## Operating Range

- Pressure: 15 to 150 psi (1,04 to 10,35 Bars)
- Flow: 2 to 150 gpm (0,45 to 34,1 m<sup>3</sup>/h; 0,13 to 9,45 l/s)
- Temperature: up to 110 F (43 C)

## Models

- 100PGA 1" NPT (25mm)
- 150PGA 1 1/2" NPT (40mm)
- 200PGA 2" NPT (50mm)

Notes:  
 1. Valve and PRS-D module must be ordered separately  
 2. BSP models available, please specify when ordering

## Performance Data - PGA

### Pressure Loss (psi)

gpm	100PGA	100PGA	150PGA	150PGA	200PGA	200PGA
	Globe	Angle	Globe	Angle	Globe	Angle
	1"	1"	1 1/2"	1 1/2"	2"	2"
2	4.1	4.1	-	-	-	-
5	4.9	4.6	-	-	-	-
10	5.8	5.1	-	-	-	-
20	5.3	4.5	-	-	-	-
30	5.0	4.5	2.1	1.6	-	-
40	8.5	7.4	2.8	2.2	1.9	2.0
50	-	-	4.8	2.9	2.0	1.6
75	-	-	11.1	7.4	2.7	1.9
100	-	-	18.8	12.7	4.6	3.4
125	-	-	-	-	8.1	5.1
150	-	-	-	-	11.5	7.3

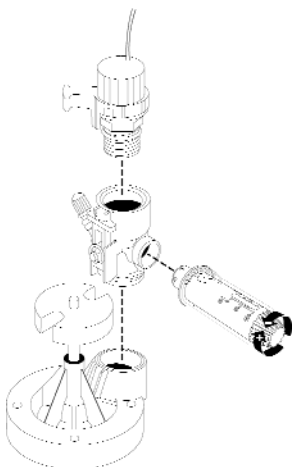
### Pressure Loss (bars)

m <sup>3</sup> /h	l/s	100PGA	100PGA	150PGA	150PGA	200PGA	200PGA
		Globe	Angle	Globe	Angle	Globe	Angle
		1"	1"	1 1/2"	1 1/2"	2"	2"
0.5	0,14	0,29	0,28	-	-	-	-
1	0,28	0,32	0,31	-	-	-	-
2	0,56	0,38	0,34	-	-	-	-
3	0,83	0,39	0,34	-	-	-	-
4	1,11	0,38	0,32	-	-	-	-
5	1,39	0,36	0,31	-	-	-	-
6	1,67	0,35	0,31	-	-	-	-
7	1,94	0,37	0,32	0,15	0,11	-	-
8	2,22	0,47	0,41	0,17	0,13	-	-
9	2,50	0,57	0,50	0,19	0,15	-	-
10	2,78	-	-	0,25	0,17	-	-
12	3,33	-	-	0,38	0,24	0,14	0,11
14	3,89	-	-	0,54	0,35	0,16	0,12
16	4,40	-	-	0,69	0,46	0,18	0,13
22	6,10	-	-	1,23	0,83	0,30	0,22
28	7,80	-	-	-	-	0,54	0,34
34	9,44	-	-	-	-	0,79	0,50

Notes:  
 1. Loss values are with flow control fully open.  
 2. PRS-D module recommended for all flow rates.

## PRS-Dial

Pressure regulating module



The PRS-Dial is an excellent means of regulating outlet pressure at the valve.

It is used where consistent outlet pressure regulation is required regardless of inlet pressure variations. The visible scale makes installation quick and easy. The regulator fits all Rain Bird PGA, PESB, and BPES valves. Simply insert between the solenoid and valve bonnet for quick and easy field installation.

## Features

- Regulates and maintains constant outlet pressure between 15 and 100 psi (1,0 to 6,9 bars) within +/- 3 psi (+/- 0,2 bars)
- Adjustment knob with detents permits fine-tune setting in 1/3 psi (0,02 bars) increments
- Schrader valve connects pressure hose gauge, ordered separately

- Inlet pressure difference must be 15 psi (1 bar) greater than desired outlet pressure for PRS module to function
- Easy field installation. PRS Dial threads underneath solenoid and adapter
- Improved spike reduction capabilities reduce water hammer
- Dial cartridge retrofits into existing PRS-B units

## Model

- PRS-D
- PRSPIC (dial cartridge)
- PHG (pressure hose gauge)



# Valve Wire Sizing Procedure

## Step 1

Determine actual distance, along wire run, from controller out to the first valve on a circuit and between each succeeding valve on a multiple valve circuit (as shown in example).  
 Example: (Two watt solenoid, 26.5 volt transformer at 80 psi water pressure at valves.)

## Step 2

Calculate the equivalent circuit length for each valve circuit on the controller. (See Calculations)

## Step 3

Selecting Common Ground Wire Size: Using the longest equivalent length calculated above, go to the

appropriate valve chart and select a ground wire and a control wire that are as close to the same size as possible (the ground wire size should always be equal to or one size larger than the control wire size.) In the example above, the circuit for station #3 has the longest equivalent length, 7000 feet. In the chart (for this example use the chart for 80 psi water pressure at the valve and a 26.5 volt transformer) select a wire size of 14 for both the common ground wire and control wire. Since one common ground wire shall be used for all valves on the controller, you have now established the common ground wire size for that controller as size 14 wire.

## Step 4

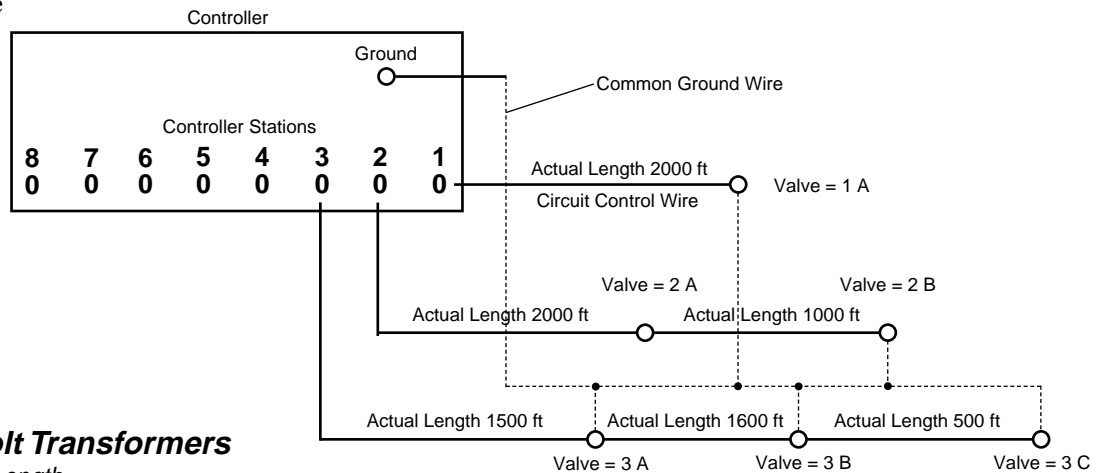
Sizing Circuit Control Wires: Using the common ground wire size selected in Step 3 (size 14), proceed to select each control wire size from the chart using the calculated equivalent length for each circuit.

### Calculations:

**Station #1:** Equiv. Length = 1 valve x 2000 ft. = 2000 ft. select size 18 control wire

**Station #2:** Equiv. Length = (1 valve x 1000 ft.) + (2 valves x 2000 ft.) = 5000 ft. select size 16 control wire

**Station #3:** Equiv. Length = (1 valve x 500 ft.) + (2 valves x 1000 ft.) + (3 valves x 1500 ft.) = 7000 ft. select size 14 control wire



## Valves with 26.5 Volt Transformers

Equivalent Feet of Circuit Length

### 80psi (5,5 bars) Water Pressure at Valve

Common Wire Size	Control Wire Size				
	18	16	14	12	10
18	3000	3700	4300	4800	5200
16	3700	4800	5900	6900	7700
14	4300	5900	7700	9400	11000
12	4800	6900	9400	12200	15000
10	5200	7700	11000	15000	19400

### 100psi (6,9 bars) Water Pressure at Valve

Common Wire Size	Control Wire Size				
	18	16	14	12	10
18	2800	3500	4100	4500	4900
16	3500	4500	5500	6500	7300
14	4100	5500	7200	8900	10300
12	4500	6500	8900	11500	14100
10	4900	7300	10300	14100	18300

**Rain Bird Agri-Products Co.**  
 633 W. Foothill Blvd.  
 Glendora, CA 91741-2469  
 Phone: (800) 435-5624  
 Fax: (626) 852-7310

**Rain Bird International, Inc.**  
 145 N. Grand Ave.  
 Glendora, CA 91741-2469  
 Phone: (626) 963-9311  
 Fax: (626) 963-4287